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ABSTRACT

The effect of clarity of explanation on student learning and perception of teacher and course effectiveness is examined. Two levels of clarity were utilized, as determined by appropriate use of examples and sequencing of instruction. Three instruments were used to measure the dependent variables: university student rating form; affective questionnaire; and a twenty-item posttest designed to measure student learning. Three groups of university students participated in the study: experimental (unclear) and experimental (clear), both receiving treatment, rating form, questionnaire, and posttest, and control, receiving only treatment and posttest. Results of the study suggest the relative independence of clarity of explanation from other indicators of teacher effectiveness as judged by students on the teacher rating instrument. Results also confirm that significant learning occurred during the clear presentation. (Author/MJB)

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CLARITY OF EXPLANATION: A POWERFUL INDICATOR OF TEACHER EFFECTIVENESS

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INTRODUCTION

The research literature is replete with studies examining indicators or traits of teacher effectiveness as measured by student rating forms (de Wolf, 1974). The quality and quantity of these "indicators" vary greatly from study to study. A frequency count of the most consistently mentioned indicators across studies was conducted by the first author. This study showed the following (not in order of frequency) to be the most frequently mentioned indicators of teacher effectiveness: (1) preparation, (2) knowledge of subject matter, (3) appropriateness of workload, (4) evaluation and grading, (5) clarity of presentation, (6) motivation, (7) interest in student, (8) enthusiasm, and (9) interpersonal relationships. Generally, the studies were replications, extensions, or embellishments of Edwin Guthrie's work in which students described what they felt were critical attributes of effective teaching. While numerous follow-up studies differ methodologically and in terms of statistical sophistication, they share the same limitations of being ex-post-facto research. Kerlinger (1973) points out

three such limitations. Two seem very applicable to this body of research. They are (1) the inability to manipulate the independent variables, and (2) the risk of improper interpretation. One alternative to ex-post-facto research is, of course, experiemental research. Little experimental research has been done since no construct of effective teaching exists and because of the difficulty of controlling irrelevant variables when live teachers are used. (Frey, 1974; Thorndike, 1975; Doyle, 1975; Brandenburg, 1975; Korb, 1977).

One attempt to actually manipulate an indicator of teacher effectiveness was conducted by Zelby (1974) in which he defined effective teaching as the act of helping students "develop the ability to learn independently." He taught two sections of two courses. In one section of each course he taught "normally." In the other section, he taught "effectively."

His operational definition of effective teaching implied that a lack of clarity in presentation of examples and content facilitated independent thinking on the part of the students.

His students rated him as a less effective teacher when he taught with the "more effective method." From this Zelby concluded that students do not necessarily rate teachers on their effectiveness. An alternative explanation for the results he obtained might be that his students were actually rating him on clarity of presentation; the variable he was actually manipulating.

In other words, clarity of explanation was a more potent variable in Zelby's study than was practice in independent thinking.

Logically, a clear presentation should be "better" than an unclear presentation; better in terms of higher affect and higher achievement. But what does "clear" mean? What are students rating when they rate a teacher's clarity?

Two factor analyses (Frey, Leonard and Beatty, 1975; and French-Lazovik, 1974) showed that factors which could be titled Clarity of Presentation were very powerful characteristics. The factor loadings were alike in some respects and different in others. The differences were at least partially due to the different instruments used. Frey's factors were "(1) presentations clarified material, (2) presented clearly and summarized and (3) good use of examples." French-Lazovik's factors were (1) interprets difficult or abstract ideas clearly, (2) makes good use of examples and illustrations, (3) has presented the course in an organized manner, and (4) inspires confidence in his/her knowledge of the subject.

The present study is the antithesis of Zelby's study and the complement of Frey's and French-Lazovik's. The antithesis of Zelby in the sense of offering an alternative hypothesis which would predict the outcomes he received, yet be methodologically different enough that the results obtained would not substantiate his hypothesis. This study is the complement of Frey's and French-Lazovik in the sense that factor analysis is an ex-post-facto exploratory research tool which helps

define factors, where this study actually manipulates a resultant factor in an attempt to validate the factor as a characteristic of effective teaching.

The purpose of this study was to experimentally manipulate potential components of clarity of explanation (as identified by factor analysis studies) and measure their effects on student achievement and teacher rating forms. To do this, a teacher who traditionally had received below average ratings on "clarity of explanation" was identified. He agreed to teach one day's lecture and allowed the authors to videotape and use the lecture as part of this study. He was not aware of the variable of interest. A transcription of the lecture constituted the "unclear" treatment. The original lecture was reworked to produce the clear treatment.

It seemed a simple matter to make a lecture ridiculously unclear. But that would decrease external validity. Therefore, the original "real world" lecture constituted the unclear treatment. If an incredible lecture was presented, a low set response would probably appear as students rated the instructor. A secondary purpose of this study was to measure the relative independence of clarity of explanation as it related to other teacher characterisitics.

The independent variable was clarity of explanation. Two levels of clarity were defined as clear and unclear. Two components of clarity identified above were used to operationally

separate clear from unclear. The first factor was the appropriate use of examples. The clear presentation had two examples to illustrate each major concept. The unclear lecture was observed to present examples at times, one example at other times, and, in one instance, an incorrect example. The second factor was the sequencing of instruction. The clear presentation was organized in a "Logical" manner (components of concepts were presented in support of concepts, etc.). The sequencing of the unclear presentation was similar to the clear lecture. However, not all supporting information for any given concept was presented in conjunction with that concept. The dependent variables were (1) amount of learning as measured by a test written by the teacher (12 multiple choice items), (2) attitude toward the course, teacher and course content measured by a five item affective questionnaire, and (3) student ratings of teacher effectiveness as measured by a shortened Brigham Young University Instructor Rating Form. Items such as quality of textbook and quality of laboratory were deleted from the form since students had no way to make a judgment on them.

HYPOTHESIS I Ss receiving a clear lecture will score higher on the posttest than Ss receiving the unclear lecture.

HYPOTHESEIS II Ss receiving a clear lecture will rate the teacher higher on factors related to clarity of explanation (i.e., organization, clarity

and objectives) than Ss receiving an unclear lecture.

HYPOTHESIS III Ss receiving a clear lecture will not rate factors unrelated to clarity of explanation different from Ss receiving an unclear lecture.

METHOD

Subjects

Nineteen students enrolled in an introductory psychology class at Brigham Young University volunteered to take part in the study. They were told the study concerned the use of video-tapes as an alternative to live instruction. Ss were randomly assigned to one of the two treatment groups or the control group. They were then notified by phone as to the appropriate time to arrive for their portion of the study.

Material

A Sony video-recorder and Trinitron playback unit were used to record treatment instruction. A Trinitron play-back unit was used to present the instruction to students.

The original lecture was videotaped, transcribed, and revised as stated above. The transcribed and revised versions were then written in outline form. These outlines served as lecture notes for the subsequent recording of treatments. Both clear and unclear versions were videotaped using the same instructor. This instructor was different from the original

instructor. This was done in an attempt to control all teacher variables (i.e., personality, voice quality, etc.) other than clarity of presentation.

The content of the instruction came from Biology and dealt with ecosystems, biospheres, and food chains.

Three instruments were used to measure the dependent variables. These were: (1) a shortened BYU student rating form, (2) an affective questionnaire which contained items such as "How would you feel about taking a course from this instructor?" and "How would you feel about taking a course dealing with this subject matter?", rated on a five point scale, and (3) a posttest of 12 multiple choice items written by the original instructor to test the segment of instruction used in this study.

Procedures

The two treatment groups (clear and unclear lecture) viewed the respective treatments as groups. They were then given the posttest, the teacher rating form, and lastly the affective questionnaire. Each instrument was completed and returned to the administrator before the next instrument was administered.

The control groups was given only the posttest. This was to determine whether the treatments resulted in learning.

RESULTS

The first hypothesis, Ss receiving a clear lecture will score higher on the posttest than Ss receiving the unclear lecture, was upheld, $p < .05$. A Newman-Kuell test showed each mean was significantly different from the others $p < .05$. Table 1 shows the ANOVA for the posttest results and Newman-Kuell information.

Insert Table 1 About Here

The second hypothesis, Ss receiving a clear lecture will rate the teacher higher on factors related to clarity of explanation than Ss receiving an unclear lecture, was upheld. Clarity of explanation $p < .01$, clarity of objectives $p < .01$, course organization $p < .01$. Table 2 shows the statistical information derived from the student rating forms.

Insert Table 2 About Here

The third hypothesis, Ss receiving a clear lecture will not rate factors unrelated to clarity of explanation different from Ss receiving an unclear lecture was upheld. None of the affective items showed differences between the groups. Likewise, no factors other than those mentioned in hypothesis two were significantly different between groups.

TABLE 1

Analysis of Variance and Newman Keuls Proceedure for Student Performance on Posttest.

	Sum of Squares	d f	Mean Square	F
Between Groups	69.76	2	34.88	16.81
Within Group	33.19	16	2.07	
Total	102.95	18		

	N	Mean	Standard Deviation
Clear	7	10.14	.90
Unclear	6	8.17	1.60
Control	6	5.50	1.76

Newman Keuls Results

	5.50	8.17	10.14
8.17	2.67*	4.64*	
10.14		1.97*	

* p .05

TABLE 2

Means and Standard Deviations of Various Indicators on the BYU Teacher Rating Form.

	Mean		Standard Deviation	
Overall Rating	Clear N = 7	Unclear N = 6	Clear	Unclear
Please give us your overall rating of this course (apart from your feelings about the instructor):	3.57	2.767	.79	.82
Clarity of objectives	4.27	2.50	.76	1.05
Course organization	4.43	2.50	.54	.84
Relevance and usefulness of course content	3.29	3.17	.95	.98
Overall Rating				
Please give us your overallrating of this instructor (apart from your feelings about the course):	3.14	2.33	.69	1.03
Knowledge of subject matter	3.86	3.0	.69	.89
Interest in the subject matter	3.14	2.83	.90	.98
Preparation for class	3.14	2.67	.69	.87
Clarity of explanations and examples	4.29	3.17	.49	.75
Level of teaching is appropriate for the course	3.33	3.00	1.03	.63

* $p < .01$

Ratings on clarity of explanation and course organization correlated higher than any other variables with achievement scores (.78 and .76, respectively).

Discussion

This study adds support to the factor analytical studies which found that "clarity of presentation" was composed of, among other items, the use of examples and organizational structure. The results also support an alternate hypothesis for Zelby's findings (1974). The differences in the cognitive test scores between groups shows the impact of providing clear instruction. The study also adds a point to the side in favor of using student rating forms to measure teacher effectiveness. To at least a certain extent, students can tell the difference.

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NOTE: Sirce the writing of this report this study has been replicated using a different population of students with nearly identical results. This was done because of a small number of subjects in each cell in the original study. No significant changes were found between the findings of the original study and the replication study.

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